

I should be able to:

- perform required conversions between the imperial system and the metric system using a variety of tools (e.g., tables, calculators, online conversion tools), as necessary within applications
- solve problems involving the areas of rectangles, triangles, and circles, and of related composite shapes, in situations arising from real-world applications
- solve problems involving the volumes and surface areas of rectangular prisms, triangular prisms, and cylinders, and of related composite figures, in situations arising from real-world applications

Vocabulary

MAP4C Math Exam Review

Measurement

1 Convert the following

a) 48 quarts to gallons

12 gallons

b) 38 pints to quarts

19 quarts

c) 20 feet to inches

336 inches

d) 60 cups to quarts

15 quarts

e) 21 pounds to ounces

336 ounces

f) 32 in. to cm.

81.28 cm

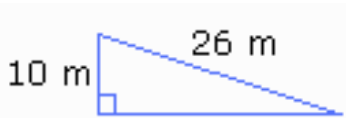
g) 17 lbs. to grams

7711 g

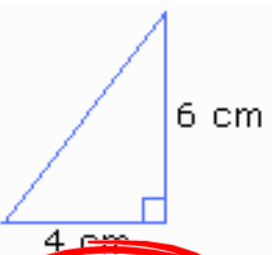
h) 60 m to yards

65.6 yards

2 Find the area of the triangles shown.



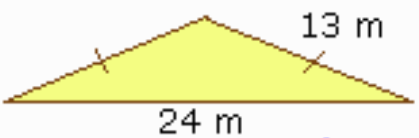
a) 120 m²



b) 12 cm²

c) Michelle is planning to repaint the two gables of her house. One of them is shown. A can of paint covers 10 m². How many cans does she need?

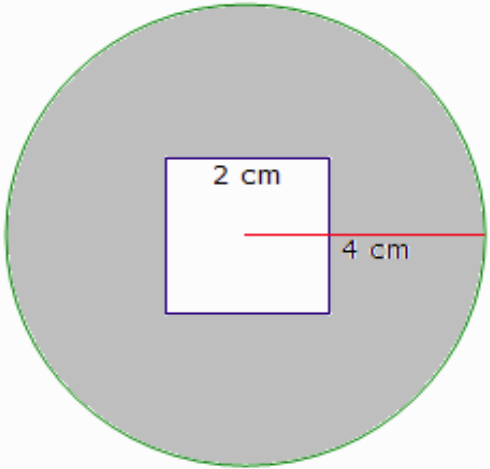
12 m²



120 m² 12 cans

a) An engine seal is circular in shape, with a square cutout to fit over a shaft, as shown. Find the area of rubber required to make the seal.

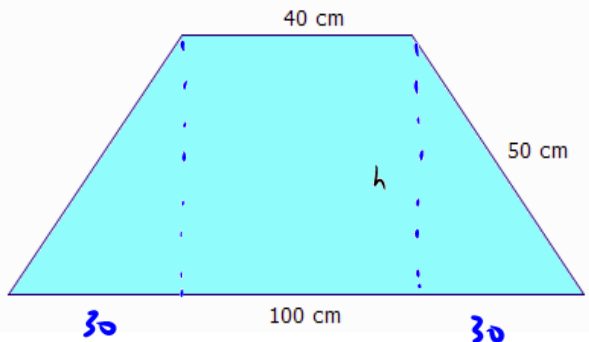
46.3 cm



b) The inside and outside edges of the seal have an embedded steel wire to add strength. How much wire is needed?

33.1 cm

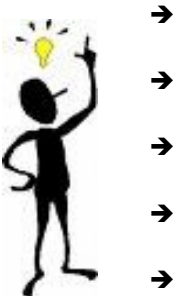
c) Ducts are made by cutting shapes from sheet metal, and then, bending them. One such shape is shown. What area of metal is required to make the shape?



$$A = \frac{(a+b)(h)}{2}$$
$$= \frac{(40+100)(40)}{2}$$
$$= 2800 \text{ cm}^2$$

$$30^2 + h^2 = 50^2$$
$$h^2 = 2500 - 900$$
$$h^2 = 1600$$
$$h = 40 \text{ cm}$$

Correction Notes for Measurement Unit Test



4

- a) A DVD player came packaged in a box with a base measuring 30 cm by 40 cm, and a height of 20 cm. Find the volume and the surface area of the box.

$$V = lwh$$

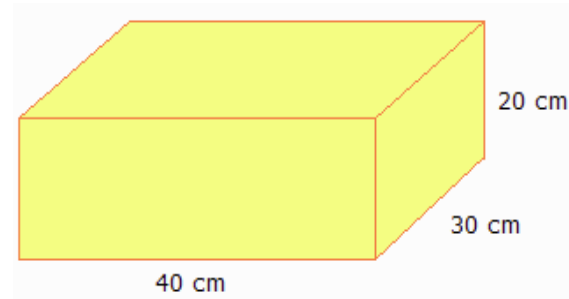
$$= (40)(20)(30)$$

$$= 24000 \text{ cm}^3$$

$$SA = 2(lw + lh + wh)$$

$$= 2(40(30) + 30(20) + 40(20))$$

$$= 5200 \text{ cm}^2$$



- b) Determine the volume of the box if all dimensions were doubled.

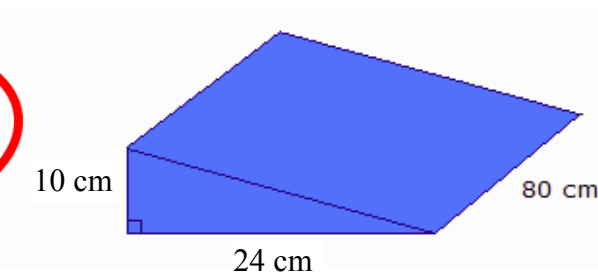
$$V = 24000 (2^3)$$

$$= 192000 \text{ cm}^3$$

- c) Sam made a small ramp to allow him to roll a dolly over a doorstep more easily, as shown. Find the volume and the surface area of the ramp.

$$V = 9600 \text{ cm}^3$$

$$SA = 5040 \text{ cm}^2$$

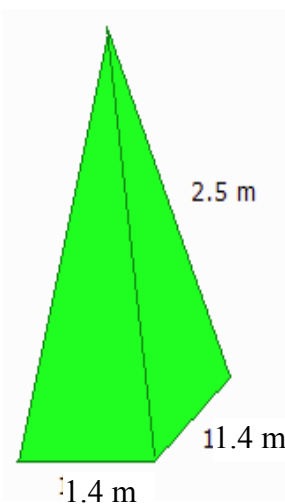


- d) Renata bought a "change tent" in the shape of a pyramid to use at track meets, with dimensions as shown. Find the volume of the tent, and the surface area

$$V = 1.372 \text{ m}^3$$

$$SA = 8.96 \text{ m}^2$$

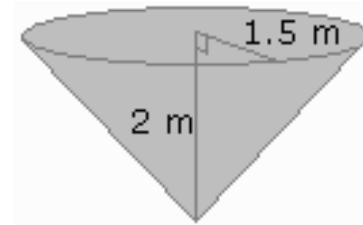
$$1.568 \text{ m}^3$$



5

- a) Sawdust from a woodworking shop is blown into a conical hopper for recycling into other products. The hopper has a radius of 1.5 m and a height of 2 m. Find the area of aluminum needed to make the sides and top of the hopper.

$$18.8 \text{ m}^2$$



- b) The sides of the hopper will be painted to make it more attractive. A can of spray paint covers 3 m^2 . How many cans are required to paint the sides of the hopper?

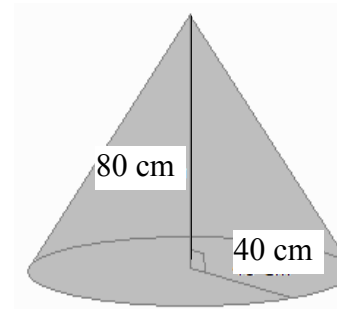
$$\text{approx. } 4 \text{ cans}$$

6

- a) Randall bought two conical concrete markers for the entrance to his driveway. Each had a radius of 0.4 m and a height of 0.8 m. How much concrete was needed to make the markers?

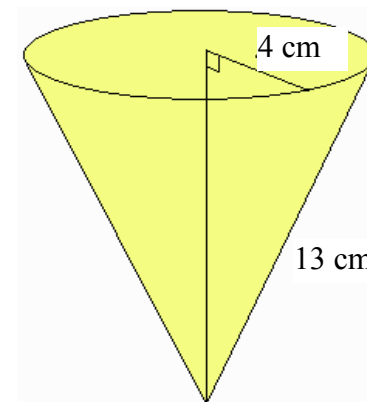
$$0.26 \text{ m}^3$$

$$\text{or } 264 \text{ L}$$



- b) Inidira has purchased a 5L bag of peanuts. She plans to pour the peanuts into conical cups with a radius of 4 cm and a slant height of 13 cm to sell at the town fair. How many cups can she fill?

$$\text{approx. } 24 \text{ cups}$$



7

- a) A spherical storage tank has a radius of 8 m. Find the surface area of the tank.

$$SA = 804 \text{ m}^2$$

- b) A can of paint covers 20 m^2 and costs \$30. How much will it cost to paint the tank?

$$\text{approx. } \$1230.00$$

$$\$1206$$

- c) A new tank will be built with a surface area of 2000 m^2 . What radius will be required?

$$12.6 \text{ m}$$

8

- a) A tennis ball has a radius of 3.2 cm. Find the volume of the ball.

$$137.3 \text{ cm}^3$$

- b) A dozen tennis balls were placed in a box such that they just fit, forming a single layer 3 balls by 4 balls. How much empty space was left in the box?

$$1498 \text{ cm}^3$$

9

- a) A prism shaped can contains individually wrapped chocolates that each take up about 28 cm^3 of space. Determine how many chocolates a container of height 15 cm will hold. (Area of Base is 55 cm^2)

$$30 \text{ chocolates}$$

- b) Sweet Shapes wants to reduce the size of each chocolate by 15%. Determine the volume of 100 of the reduced chocolates.

$$2380 \text{ cm}^3$$

- c) Next year, Sweet Shapes will produce a **cylindrical can** for the chocolates. The can will contain 75 wrapped chocolates, each with a volume of 19 cm^3 . This can will also have a **height of 15 cm**. Determine the radius of this can.

$$\text{approx. } 5.5 \text{ cm}$$